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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,908	02/28/2002	Maxim A. Bolshtyansky	1-14	2903

7590 06/17/2004

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EXAMINER	
NGUYEN, TUAN N	

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,908	BOLSHTYANSKY ET AL.	
	Examiner	Art Unit	
	Tuan N Nguyen	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-8,11,12,14,16 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-8,11,12,14,16 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 April 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In responding to applicant's amendment filed 03/22/2004, applicant's arguments with respect to claims 1, 3, 5-8, 11, 12, 14, 16, 17 have been considered but are moot in view of new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of 35 U.S.C. 102(e) which forms the basis for all obviousness rejections set forth in this Office action:

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1, 3, 7, 8, 12, 14, 16, 17 are rejected under 35 U.S.C. 102(e) as being unpatentable over Fidric et al. (US 6434302).

With respect to claims 1, 3, 7, 8, 12, 14, Fidric et al. '302 shows in figures 1-16, and discloses in the ABSTRACT an optical fiber laser comprising: a laser cavity defined by reflective devices comprising cladding pumped, having multi-mode source; with combiner having at least first, second and third port, wherein multi-mode pump source couple first port of the combiner and coupled to second and third ports within laser cavity; where the combiner comprising a tapered fiber bundle and being configured to couple pump light from the multi-mode pump source into the laser cavity untilizing mode-based coupling without the use of wavelength-based coupling. Since claim 12 recites the same or identical elements/limitations it is inherent to use patents ('302) to recite the method for combining laser light with pump light in an optical fiber laser device, product by process.

With respect to claims 16, 17 Holcomb '637 discloses the cladding includes a rare earth doped core (Col 6: 34-40) with low index coating, and where the lasing medium comprises a single-mode fiber (Col 4: 45-65).

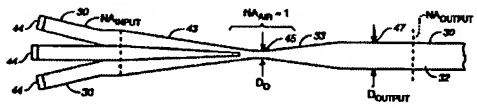
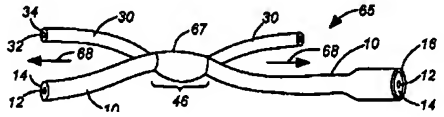


FIG. 10



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NA output from the diverging taper is the double clad fiber inner cladding, also referred to at times as the pump cladding. The diverging taper may also be a portion of the input of the output fiber. In another embodiment, a single mode fiber may be combined with a plurality of multimode fibers to form a fused converging-to-diverging taper coupler having an output substantially matching the NA of the NA of the output fiber. Disclosed are several ways for forming the minimum diametrical waist followed by the monotonically increasing taper.

In a disclosed embodiment, a multimode fibers/single mode fiber to double clad fiber optical (MMFs/SMF/DCF) coupler comprises a single mode fiber with a first core, a plurality of multimode fibers bundled around said single mode fiber forming a bundled arrangement and a double clad fiber having an inner cladding with a second core. The bundled arrangement is fused and, then, an end of the double clad fiber is butt coupled to an end of the fused, bundled arrangement with the first and second cores in aligned relation. The fused, bundled arrangement has a diametrical cross-section substantially equal to the diametrical cross-section of the double clad fiber inner cladding. The multi-

In FIG. 2, the single mode fiber (SMF) 20 has a core 22 surrounded by a lower index outer cladding 24 with a diameter of d_2. Compared to the DCF 10 of FIG. 1, the cladding diameter is such that $d_2<d_1$. Also, the mode field diameter is also equal to approximately $2w_1$ for good mode matching with the single mode core 12 of the DCF 10.

In FIG. 3, the multimode fiber (MMF) 30 comprises a comparatively large core 32 surrounded by a lower index cladding 34 having a diameter d_3 and a numerical aperture NA_3 where $NA_3<NA_1$ that permits the propagation of multiple modes.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

5. Claims 5, 6, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fidric et al. (US 6434302) in view of Alphonse et al. (US 6363088).

Fidric et al. (US 6434302) discloses the above, and the claims further require that the first and second reflective devices are fiber Bragg grating that has high index coating, and the optical fiber laser is bidirectionally pumping. Alphonse '088 discloses an optical system with optical pump coupled to rare earth cladding fiber with reflectors at ends, having grating with high index coating and bidirectionally pumping use in communication (ABSTRACT, Col2; Col 6: 65-67, Col 7) (Col 3: 12-15; Col 6: 65-67; Col 11: 42-55). For the benefit of having grating fiber and bidirectional pumping, it is within one skill in the art to provide Fidric et al. '302 the teaching of Alphonse '088.

Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3329.

Tuan N. Nguyen

Don Wong
Supervisory Patent Examiner
Technology Center 2800